



AIRCRAFT MATERIALS FOR CORROSION PREVENTION AND CONTROL: A QUALIFIED PRODUCTS LIST

John J. DeLucia, Ph.D.
Air Vehicle and Crew Systems Technology Department (Code 606)
NAVAL AIR WARFARE CENTER
AIRCRAFT DIVISION WARMINSTER
P.O. Box 5152
Warminster, PA 18974-0591

September 1993

FINAL REPORT

FAA Interagency Agreement No. DTHA93-90-A-00029

Approved for Public Release; Distribution is Unlimited.

Prepared for
Dr. Thomas Flournoy, ACD-210
DEPARTMENT OF TRANSPORTATION
FAA Technical Center
Atlantic City International Airport, NJ 08405

[DTC QUALITY INSPECTED 3]

19970604 091

NOTICES

REPORT NUMBERING SYSTEM — The numbering of technical project reports issued by the Naval Air Warfare Center, Aircraft Division, Warminster is arranged for specific identification purposes. Each number consists of the Center acronym, the calendar year in which the number was assigned, the sequence number of the report within the specific calendar year, and the official 2-digit correspondence code of the Functional Department responsible for the report. For example: Report No. NAWCADWAR-92001-60 indicates the first Center report for the year 1992 and prepared by the Air Vehicle and Crew Systems Technology Department. The numerical codes are as follows:

CODE	OFFICE OR DEPARTMENT
00	Commanding Officer, NAWCADWAR
01	Technical Director, NAWCADWAR
05	Computer Department
10	AntiSubmarine Warfare Systems Department
20	Tactical Air Systems Department
30	Warfare Systems Analysis Department
50	Mission Avionics Technology Department
60	Air Vehicle & Crew Systems Technology Department
70	Systems & Software Technology Department
80	Engineering Support Group
90	Test & Evaluation Group

PRODUCT ENDORSEMENT — The discussion or instructions concerning commercial products herein do not constitute an endorsement by the Government nor do they convey or imply the license or right to use such products.

Reviewed By: Lorraine Fletcher Date: 7/22/94
Branch Head

Reviewed By: Douglas D. Shaffer Date: 7/27/94
Division Head

Reviewed By: John M. Mathews Date: 7/28/94
Director/Deputy Director

REPORT DOCUMENTATION PAGE

*Form Approved
OMB No. 0704-0188*

Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503.

1. AGENCY USE ONLY (Leave blank)	2. REPORT DATE	3. REPORT TYPE AND DATES COVERED
	SEPTEMBER 1993	FINAL
4. TITLE AND SUBTITLE		5. FUNDING NUMBERS
AIRCRAFT MATERIALS FOR CORROSION PREVENTION AND CONTROL: A QUALIFIED PRODUCTS LIST		FAA INTERAGENCY AGREEMENT NO. DTFA03-90-A-00029
6. AUTHOR(S)		
JOHN J. DE LUCCIA, Ph.D.		
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)		8. PERFORMING ORGANIZATION REPORT NUMBER
AEROSPACE MATERIALS DIVISION (CODE 606) AIR VEHICLE AND CREW SYSTEMS TECHNOLOGY DEPARTMENT NAVAL AIR WARFARE CENTER AIRCRAFT DIVISION P.O. BOX 5152 WARMINSTER, PA 18974-0591		NAWCADWAR-94099-60
9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES)		10. SPONSORING / MONITORING AGENCY REPORT NUMBER
DR. THOMAS FLOURNOY, ACD-210 DEPARTMENT OF TRANSPORTATION FAA TECHNICAL CENTER ATLANTIC CITY INTERNATIONAL AIRPORT, NJ 08405		
11. SUPPLEMENTARY NOTES		
INTENDED/SUGGESTED AS CHAPTER 8 IN FAA'S ADVISORY CIRCULAR AC 43-4A OF 1991, ON CORROSION CONTROL FOR AIRCRAFT		
12a. DISTRIBUTION / AVAILABILITY STATEMENT		12b. DISTRIBUTION CODE
APPROVED FOR PUBLIC RELEASE; DISTRIBUTION IS UNLIMITED.		
13. ABSTRACT (Maximum 200 words)		
<p>This is a product list of materials for corrosion prevention and control that have been tested and are known to perform to the strict requirements of the military. This report was produced for the Federal Aviation Administration to be incorporated into their Advisory Circular on Corrosion Control for Aircraft, AC-43-4A, as chapter 8. Although written for civil aviation, the product information contained herein is valuable to all aircraft maintenance communities—both military and civilian. The products are grouped under the generic classes of materials: cleaners; sealants; and corrosion preventive compounds. Brief descriptions of the product classes relating to their function for corrosion prevention and/or control are given. Product lists, appropriately grouped, are given along with manufacturer's names and addresses.</p>		
14. SUBJECT TERMS		15. NUMBER OF PAGES
CLEANERS; WATER DISPLACING CORROSION PREVENTIVE COMPOUNDS; SEALANTS; CORROSION CONTROL PRODUCTS		
16. PRICE CODE		
51		
17. SECURITY CLASSIFICATION OF REPORT	18. SECURITY CLASSIFICATION OF THIS PAGE	19. SECURITY CLASSIFICATION OF ABSTRACT
UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED
20. LIMITATION OF ABSTRACT		
		UL

**AIRCRAFT MATERIALS FOR CORROSION PREVENTION
AND CONTROL; A QUALIFIED PRODUCTS LIST**

John J. DeLuccia, Ph.D.
(Senior Materials Engineer,
Naval Air Warfare Center Aircraft Division
Warminster, PA 18974)

Intended/suggested as Chapter 8 in FAA's Advisory Circular
AC 43-4A of 1991, on Corrosion Control for Aircraft

DTIC QUALITY INSPECTED 8

Date: September, 1993

100-100010054

CHAPTER 8
TABLE OF CONTENTS

800.	INTRODUCTION	1
801.	CLEANERS.....	1
802.	AIRCRAFT COATINGS	24
803.	SEALANTS	24
804.	CORROSION PREVENTIVE COMPONENTS.....	32
805.	DESCRIPTION OF CPCs.....	32

CHAPTER 8

Aircraft Materials for Corrosion Prevention and Control:
A Qualified Products List

800. INTRODUCTION. Corrosion on aircraft can adversely affect airframes, avionics and propulsion systems. This narrative and list will deal primarily, though not exclusively, with those materials and products that affect airframes. The list reflects those products that have been shown to provide necessary and sufficient corrosion control properties as tested and deemed acceptable, thus, "qualified," by the U.S. military. The products are grouped under generic classes of materials, i.e. cleaners, coatings, sealants, and corrosion preventive compounds. Brief descriptions of the product classes relating to their function for corrosion prevention and/or control are given. Each class of material is followed by the list of qualified products pertaining to it and then by the product manufacturer's addresses. The FAA does not endorse the use of any particular product, nor does it guarantee that this is a complete list of all commercially available products. It is noted that products not appearing on this list are not necessarily unacceptable under all conditions. This is a product list of materials that have been tested and are known to perform to the stringent requirements of the U.S. military. Since the U.S. military flies and bases its aircraft in some of the most severe environments, the products listed are considered optimal for their intended use.

801. CLEANERS.

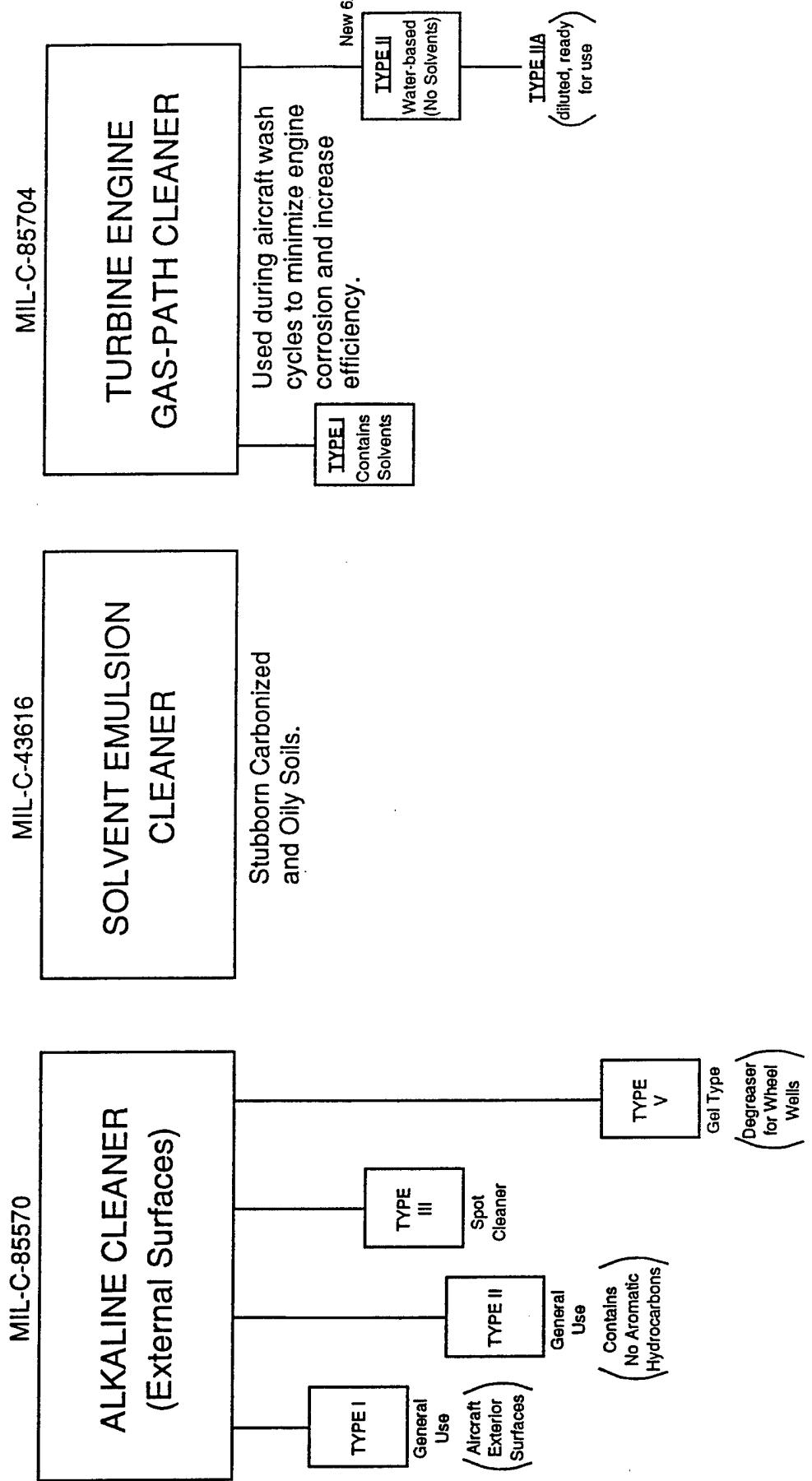
(a) Aircraft Cleaning: The choice and frequency of external aircraft cleaning varies with the conditions of flight. Aircraft cleaning can be considered the first step in preventing corrosion. Cleaning requires a knowledge of the materials and methods needed to remove corrosive contaminants and fluids which tend to retain contaminants. Some reasons for regularly cleaning the external airframe and engines are:

- Prevents corrosion by removing salt deposits, other corrosive soils, and electrolytes.
- Improves overall appearance.
- Allows inspection for corrosion and corrosion damage.
- Reduces fire hazards by removing accumulations of leaking fluids.
- Ensures aerodynamic efficiency.
- Maintains turbine engine efficiency.

(b) Cleaning Compounds: Cleaning compounds work by dissolving soluble soils, emulsifying oily soils, and suspending solid soils. There are several types of cleaning compounds, each of which cleans a surface according to one or more specific needs.

The chart shown below gives an overall view of the three categories of cleaners in general use for airframes and engine gas paths.

AIRCRAFT CLEANING COMPOUNDS



(1) Alkaline Cleaners: Highly alkaline cleaning compounds (pH greater than 10) are no longer authorized for Navy aircraft, due to incompatibility with polyimide airframe wiring insulation. Moderately alkaline cleaners (pH between 7.5 and 10), such as MIL-C-85570, are recommended for general airframe cleaning.

Recommended Types and Applications of MIL-C-85570:

Type I - General use aircraft exterior cleaner containing aromatic hydrocarbon solvent for removing heavily oxidized oils and greases. Should not be used without adequate ventilation. Normally diluted 1 part cleaner to 10 parts water (foam on, agitate, rinse off).

Type II - General use aircraft exterior cleaner containing no aromatic hydrocarbons for removing light oils, hydraulic fluids, and dirt. Can be used in areas of reduced ventilation (such as cockpits, cabins, bilges and equipment bays). Normally diluted 1 part cleaner to 10 parts water (foam on, agitate, rinse off).

Type III - Spot cleaner for high gloss paint for cleaning exhaust tracks. Used without dilution (rub on, rinse off).

Type V - Gel-type degreaser for cleaning wheel wells and replacement of some solvent cleaning where water rinsing can be tolerated. Used without dilution (spray on, let stand 5 -15 minutes, rinse off).

(The QPL for MIL-C-85570 is provided on pages 5 and 6 and the manufacturer's listing is on pages 7 through 12.)

(2) Solvent Emulsion Cleaners (Aircraft Surface):

Due to its high solvent content, MIL-C-43616 (Cleaning Compound, Aircraft Surface) becomes an emulsion when diluted. The solvent contained in the cleaner softens oily soils so that they can be emulsified by the detergent and rinsed away. MIL-C-43616 contains foaming agents to facilitate application to vertical surfaces. Since most solvent emulsion cleaners can leave very thin oil or solvent films, another type of cleaner should be used prior to pretreating, painting, sealing, or bonding. Local air pollution regulations may restrict the amount and methods of application of these types of cleaners.

The QPL for MIL-C-43616 is provided on pages 13 and 14 and the manufacturer's listing is on pages 15 through 19.

(3) Turbine Engine Gas-Path Cleaners: There are two cleaners recommended for use in engine gas paths; they are:

MIL-C-85704 Type I Solvent Based
MIL-C-85704 Type II Water Based

MIL-C-85704 is specially formulated to minimize aircraft turbine engine corrosion during wash cycles.

Because of its high solvent content, Type I behaves similarly to the solvent emulsion cleaners for aircraft surfaces, MIL-C-43616. The same considerations described for use of MIL-C-43616 apply to MIL-C-85704 Type I.

The newest version of this specification describes a solvent-free product designated Type II. Type IIA is a diluted version that is ready to use. Because they are solvent-free, these newest versions obviate some of the problems associated with pretreating, painting, sealing, or bonding directly after their use, and local air pollution requirements.

Type II has other advantages with respect to ease of application. Since it contains no solvent, it can be used while the engine is still hot; i.e., after a flight.

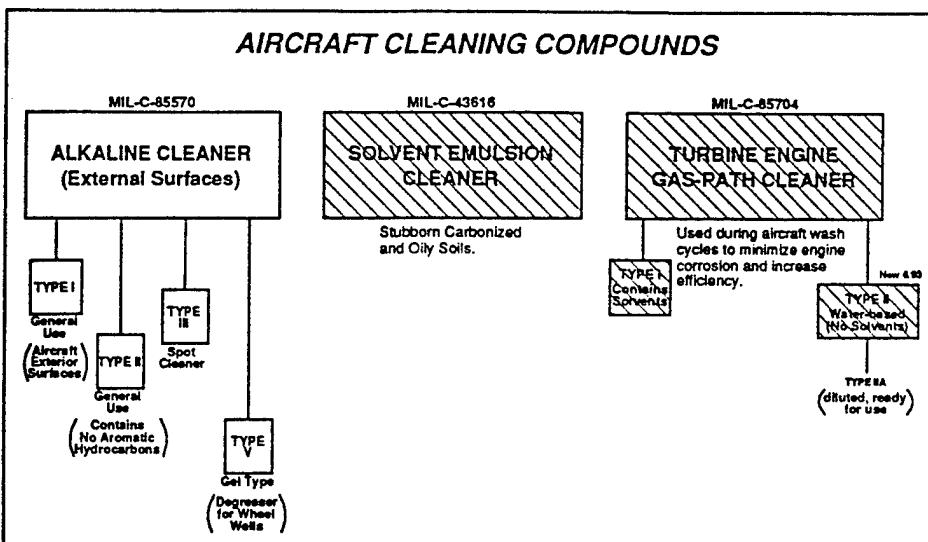
The QPL for MIL-C-85704 is provided on page 20 and the manufacturer's listing is on pages 21 through 23.

It should be noted that Type II presently has only two approved manufacturers. They are:

Turco Products Inc. 7300 Bols Avenue Westminster, CA 92684-3600 (Products: Turco 6783-50 Turco 6783-410)	B&B Tritech Inc. P.O. Box 660-176 Miami, FL 33266-0776 (Product: B&B TC-100)
----------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------

Unless otherwise noted, the qualifying agency for these products is Code 6062, NAWCADWAR, Warminster PA, 18974.

The following are qualified lists for three cleaners that are in current military use and are recommended for general use on aircraft as ownership and warranties allow:



QPL-85570-8
23 August 1991
 SUPERSEDED
 QPL-85570-7
 30 October 1989

**QUALIFIED PRODUCTS LIST
OF
PRODUCTS QUALIFIED UNDER MILITARY SPECIFICATION
MIL-C-85570
CLEANING COMPOUND, AIRCRAFT, EXTERIOR**

This list has been prepared for use by or for the Government in the acquisition of products covered by the subject specification and such listing of a product is not intended to and does not connote endorsement of the product by the Department of Defense. All products listed herein have been qualified under the requirements for the product as specified in the latest effective issue of the applicable specification. This list is subject to change without notice; revision or amendment of this list will be issued as necessary. The listing of a product does not release the supplier from compliance with the specification requirements.

GOVERNMENT DESIGNATION	MANUFACTURER'S DESIGNATION	MANUFACTURER'S NAME*
Type I	Leeder 1130-F	Ardrox Inc.
Type I	314A	B&B Tritech, Inc.
Type I	Cole Chem	Cole-Chem Corporation
Type I	AC-177	Ecolab, Inc.
Type I	Eldorado ED-399	Eldorado Chemical Co., Inc.
Type I	EZE 442	EZE Products, Inc.
Type I	M-1000-66A Megapower Exterior Aircraft Cleaner	Fine Organics Corporation

*See Appendix for addresses.

GOVERNMENT DESIGNATION	MANUFACTURER'S DESIGNATION	MANUFACTURER'S NAME*
Type I	Cee-Bee R-681	<i>McGean-Rohco, Inc.</i>
Type I	Octagon 855701	<i>Octagon Process, Inc.</i>
Type I	LD-37	<i>Omnitech International, Inc.</i>
Type I	PENN AIR M-5571	<i>Penetone Corporation</i>
Type I	1080-93-2	<i>Space Chemical, Inc.</i>
Type II	Leeder 1140-F	<i>Ardrox Inc.</i>
Type II	8505	<i>B&B Tritech, Inc.</i>
Type II	Calla 855	<i>Calla Chemical Operations</i>
Type II	Aerowash NV	<i>Diversey Inc.</i>
Type II	AC-178	<i>Ecolab, Inc.</i>
Type II	ED-410	<i>Eldorado Chemical Co., Inc.</i>
Type II	EZE 445	<i>EZE Products, Inc.</i>
Type II	MA-102	<i>JAD Chemical Company, Inc.</i>
Type II	Cee-Bee R-682	<i>McGean-Rohco, Inc.</i>
Type II	8002-2-SD	<i>F.J. Morse & Co., Inc.</i>
Type II	Octagon 855702	<i>Octagon Process, Inc.</i>
Type II	LD-38	<i>Omnitech International, Inc.</i>
Type II	PENN AIR M5572B	<i>Penetone Corporation</i>
Type II	93-1	<i>Space Chemical, Inc.</i>
Type II	Turco 6692	<i>Turco Products Inc.</i>
Type III	Contact X	<i>B&B Tritech, Inc.</i>
Type IV	Contact E	<i>B&B Tritech, Inc.</i>
Type IV	458	<i>EZE Products Inc.</i>
Type V	B&B 1986 NC-1	<i>B&B Tritech, Inc.</i>
Type V	457	<i>EZE Products, Inc.</i>
Type V	Cee-Bee R-685	<i>McGean Rohco, Inc.</i>
Type V	PENN AIR M5575	<i>Penetone Corporation</i>

*See Appendix for addresses.

MANUFACTURER ADDRESS APPENDIX

The following is an alphabetical listing of the manufacturers and plants.

Ardrox Inc.
16961 Knott Avenue
La Mirada, CA 90638

Plants:
Same as address.

Ardrox limited
19 Woodburn Ave.
St. Catherines,
Ontario, Canada L2R6Y3

B&B Tritech, Inc.
P.O. Box 660-776
Miami, FL 33266-0776

Plants:
875 W. 20th Street
Hialeah, FL 33010

101 East Baseline Road
Mesa, AZ 85234

164 Berkeley Road
Mt. Royal, NJ 08061

6500 Watson Street
Union City, GA 30291

Calla Chemical Operations
3920 Essex Lane
Box 27714
Houston, TX 77227

Plants:
Same as address.

11808 S. Bloomfield
Santa Fe Springs, CA 90670

North Railroad & Essex Sts.
Gloucester City, NJ 08030

2676 Apple Valley Rd. N.E.
Atlanta, GA 30319

Highway 90-A
Dayton, TX 77535

Cole-Chem Corporation
11123 Rolling Springs Drive
P.O. Box 621
Carmel, IN 46032

Plant:
Same as address.

Diversey Inc.
2645 Royal Windsor Drive
Clarkson Postal Station
Mississauga
Ontario, Canada L5J 1L1

Plant:
Same as address.

Ecolab, Inc.
370 Wabasha Street
Government Contracts
St. Paul, MN 55102-1307

Plants:
255 Blair Road
Avenel, NJ 07001

2305 Sherwin Road
Garland, TX 75041

3001 Channahon Road
Joliet, IL 60346

640 Lenfest Road
San Jose, CA 95116

Eldorado Chemical Co., Inc.
P.O. Drawer 34837
San Antonio, TX 78265

Plants:
14350 Lookout Road
San Antonio, TX 78233

1805 East Charter Way
Stockton, CA 95205

EZE Products, Inc.
P.O. Box 5744
Greenville, SC 29606

Plants:
Same as address.

DiChem-Dresser Corp.
Calla Chemical Operations
8100 Electric Avenue
Stanton, CA 90680

Hysan Co.
2676 Apple Valley Rd.
Atlanta, GA 30319

NAWCADWAR-94099-60
QPL-85570-8

EZE Products, Inc. (Continued)

EZE Manufacturing - SE, Inc.
603 High Tech Court
Greer, SC 29651

EZE Manufacturing - NW, Inc.
1265 Hendrickson Dr.
Kalama, WA 98625

Fine Organics Corporation
205 Main Street
Lodi, NJ 07644

Plant:
Same as address.

JAD Chemical Company, Inc.
P.O. Box 6786
Rancho Palos Verdes, CA 90734

Plant:
1541 West Cowles Street
Long Beach, CA 90813

McGean-Rohco, Inc.
9520 East Ceebee Drive
Downey, CA 90241-7000

Plants:
Same as address.

1314 Murphy Avenue
Atlanta, GA 30310

38521 Schoolcraft Avenue
Livonia, MI 48150

McGean Rohco (UK) Limited
Cee-Bee Division
Qualcast Road, Lower Horsely
Fields, Wolverhampton
West Midlands, WV1 2QP
England

The Japan Cee-Bee Chemical
Company, Limited
Taiyo Seimei Kanda Building
Number 4-3, 2-Chome
Iwamotocho
Chiyoda-ku, Tokyo, Japan

McGean Rohco Singapore PTE
Limited
#6 Tg Penjuru Crescent
Jurong, Singapore 2260

F. J. Morse & Co., Inc.
541 North Wheeler St.
St. Paul, MN 55104-1733

Plant:
Same as address.

Octagon Process, Inc.
596 River Road
Edgewater, NJ 07020

Plant:
Same as address.

Omnitech International, Inc.
800 North Acadia Avenue
Thibodaux, LA 70301

Plant:
Same as address.

Penetone Corporation
74 Hudson Avenue
Tenafly, NJ 07670

Plants:
Same as address.

West Chemical Products, Ltd.
10900 Secant Avenue
Montreal, Quebec, Canada
H1J 1S5

Space Chemical, Inc.
P.O. Box 1228
Indiana, PA 15701

Plant:
Indiana Road Extension
Blarisville, PA 15717

Turco Products Inc.
7300 Bolsa Avenue
Westminster, CA 92684-3600

Plants:
State Route 95 West
Marion, OH 43302

Ajax Chemicals
Factory St.
Granville 2142, N.S.W.
Australia

Deane & Company
190 Chemin Drive
Pointe Claire, Quebec
Canada

Turco Products, LTD
Clark House, Brunel Road
Corby, Northants
England

NAWCADWAR-94099-60
QPL-85570-8

Turco Products Inc. (Continued)

Turco-France, S.A.
3 - 5 Imp. DuQuai De
L' Industrie
F-91200 Athis-Mons
France

Turco Chemie CmBh
Wandsbeker Sheg 23
D-2000 Hamburg, 76,
W. Germany

Atlanta Hellas Chem.
Pireaus Str. 91 (Kythiron2)
Pireaus, Greece

Chemotas LTD.
Holon, Ind. Zone
13, Hasadna St.
Tel Aviv, Israel

Turco Italiana S.P.A.
1 Via Artigianale 29
25010 Montirone, Italy

Kakoki Trading Co.
Turco Division
Takanawa Kaneo Bldg.
3-25-22, Takanawa,
Minato-Ku
Tokyo, Japan 108

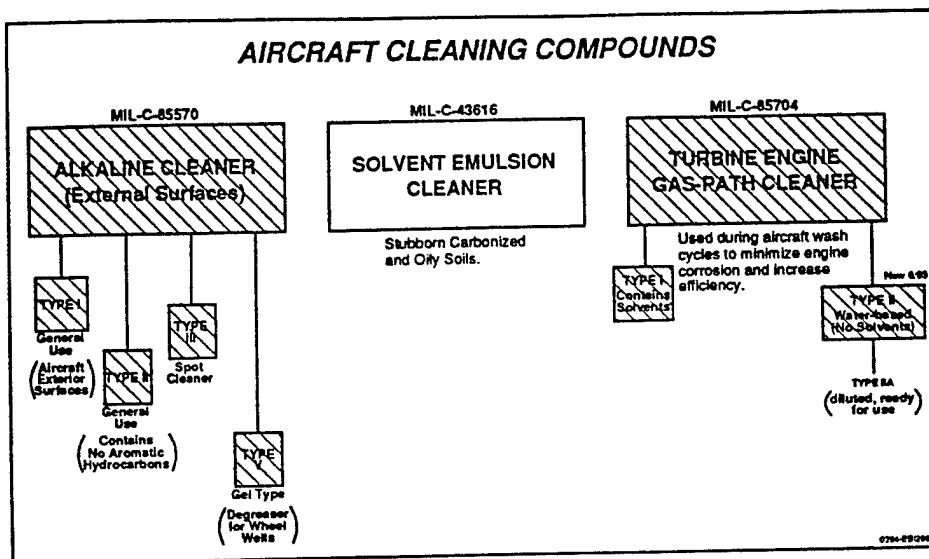
Turco & Descalzi de
Mexico, S.A. de C.V.
Poniente 148 No. 974
(Col. Industrial Vallejo)
Mexico 16, D.F. Mexico

Turco Produkten B.V.
Verlenge Blokkenweg 12
6717 AD Ede Netherland

Turco Products Inc. (Continued)

Turco Expanola, S.A.
Feixa Llarga/Calle 43
Sector F-Zona Franca
Barcelona, Spain
China Youths Chemical
Corporation
No. 39, Tong-Yun Road
Chung-Li, Shieh
Taiwan, R.O.C.

No others follow.



QPL-43616-14
31 July 1989
 SUPERSEDING
 QPL-43616-13
 8 January 1988

**QUALIFIED PRODUCTS LIST
OF
PRODUCTS QUALIFIED UNDER MILITARY SPECIFICATION
MIL-C-43616
CLEANING COMPOUND, AIRCRAFT SURFACE**

This list has been prepared for use by or for the Government in the acquisition of products covered by the subject specification and such listing of a product is not intended to and does not connote endorsement of the product by the Department of Defense. All products listed herein have been qualified under the requirements for the product as specified in the latest effective issue of the applicable specification. This list is subject to change without notice; revision or amendment of this list will be issued as necessary. The listing of a product does not release the supplier from compliance with the specification requirements.

MANUFACTURER'S DESIGNATION	MANUFACTURER'S NAME*
B&B-2020 Plus	<i>B&B Chemical Company</i>
Brulin 1-4-77N	<i>Brulin & Company, Inc.</i>
C-1-79	<i>Bulk Chemicals</i>
PPW-21	<i>Crest Industrial Chemicals</i>
Greesolv	<i>DARM-SF, Inc.</i>
101	<i>Diversified Chemical</i>
SGC-747	<i>Ecolab</i>

*See Appendix for addresses.

MANUFACTURER'S DESIGNATION	MANUFACTURER'S NAME*
ED-366	<i>Eldorado Chemical Company, Inc.</i>
AP-389	<i>Inland Specialty Chemical Corp.</i>
Intex 8241	<i>Intex Products, Inc.</i>
Cee-Bee R-677 Cee-Bee R-679	<i>McGean-Rohco, Inc.</i>
MSCI 212-10R	<i>Omega Chemical Corp.</i>
Oakite 214M	<i>Oakite Products, Inc.</i>
FH-119	<i>Octagon Process, Inc.</i>
Turco 5975A	<i>Turco Products, Inc.</i>
TIP 1096**	<i>Ardrox, Inc.</i>
1477N-NF**	<i>Brulin & Company, Inc.</i>
C-1-79/Aerosol**	<i>Bulk Chemicals</i>
FH-119/Aerosol**	<i>Octagon Process, Inc.</i>
5975-A/Aerosol**	<i>Turco Products, Inc.</i>

*See Appendix for addresses.

**Class 1A (All others are Class 1)

MANUFACTURER ADDRESS APPENDIX

The following is an alphabetical listing of the manufacturers and plants.

B&B Chemical Company
875 West 20th Street
Hialeah, FL 33010

Plants:
Same as address.

101 East Baseline Road
Mesa, AZ 85201

164 Berkeley Road
Mt. Royal, NJ 08061

6500 Watson Street
Union City, GA 30291

Brulin & Company, Inc.
P.O. Box 270B
Indianapolis, IN 46206

Plants:
2939 Columbia Avenue
Indianapolis, IN 46206

2775 Giant Road
Richmond, CA 94804

Bulk Chemicals
80 First Street
Gretna, Jefferson, LA 70053

Plant:
Same as address.

Crest Industrial Chemicals
6339 B Beverley Hill
Houston, TX 77057

Plant:
Same as address.

DARM-SF, Inc.
110 Third Terrace
DiLido Island
Miami Beach, FL 33139

Plant:
Chicago, IL 60638

Diversified Chemical
Technologies, Inc.
15477 Woodrow Wilson
Detroit, MI 48238

Plant:
Same as address.

Ecolab
Ecolab Center
St. Paul, MN 55102

Plants:
Newark, CA
San Jose, CA
Chicago, IL
Joliet, IL
Roscoe, IL
Woodbridge, NJ
Garland, TX
Beloit, WI

Eldorado Chemical Company, Inc.
P.O. Box 34837
San Antonio, TX 78265

Plants:
14350 Lookout Road
San Antonio, TX 78233

1805 East Charterway
Stockton, CA 95205

Inland Specialty Chemical Corp.
14192 Chambers Road
Tustin, CA 92680

Plant:
15202 Edgerton Road
New Haven, IN 46774

Intex Products, Inc.
P.O. Box 6648
Greenville, SC 29606

Plant:
Kings Road
Greenville, SC 29605

McGean-Rohco, Inc.
9520 East Cee-Bee Drive
Downey, CA 90241

Plants:
Same as address.
38521 Schoolcraft Road
Livonia, MI 48150

1314 Murphy Avenue, S.W.
Atlanta, GA 30310

Omega Chemical Corp.
6935 West 62nd Street
Chicago, IL 60638

Plant:
Same as address.

Oakite Products, Inc.
50 Valley Road
Berkeley Heights, NJ 07922

Plants:
Same as address.

700 Middlesex Avenue
Metuchen, NJ 08840

544 South 6th Avenue
City of Industry, CA 91749

10100 Hirsch Road
Houston, TX 77016

13177 Huron River Drive
Romulus, MI 48174

Octagon Process, Inc.
596 River Road
Edgewater, NJ 07020

Plant:
Same as address.

Turco Products, Inc.
Subsidiary Pennwalt Corp.
7300 Bolsa Avenue
Westminster, CA 92684-3600

Plants:
State Route 95 W.
Marion, OH 43302

Turco (Aust.) Pty, Ltd.
Factory Street
Granville 2142, N.S.W.
Australia

Kahoki Trading Company
Turco Division
Takanawa Kaneo Building
3-25-22, Takanawa, Minato-Ku
Tokyo, Japan 108

Deane & Company
190 Chemin Oneida Dr.
Pointe Claire, Quebec
Canada H9R1A8

Turco Products Limited
Clarke House
Brunel Road
Earlstrees Industrial Estate
Corky, Northants, England

Turco Products, Inc. (Cont'd)

Turco-France, S.A.
3 et 5 Impasse des Quai de
Industrie
91200 Athis-Mons (Essone),
France

Turco Chemie GmbH
Rossauweg 50
D-2 Hamburg 76, Germany

China Youths Chemical Corp.
2nd Fl. No. 419-1, Jen-Ai Rd.,
Sec.
Taipei, Taiwan, 106, R.O.C.

Turco DeScalzi DeMexico, S.A.
Poniente 148 No. 974
(Col. Industrial Vallejo)
Mexico 16, D.F. Mexico

Turco Produkten B.V.
Verlengde Blokkenweg 12
6717 AD Ede (Gld.) Netherlands

Protea Chemical Manufacturing
Cremark Division
Cnr-Springbok & Commando Rds.
Industria, Johannesburg 2093
Republic of South Africa

Turco Expanola, S.A.
Feixa Liarga/Calle 43
Sector F-Zona Franca
Barcelona 4, Spain

Ardrox, Inc.
16961 Knott Avenue
La Miranda, CA 90638

Aerosol packager:

Shield Packaging of California Inc.
5165 G Street
Chino, CA 91710

Brulin & Company, Inc.
P.O. Box 270B
Indianapolis, IN 46206

Aerosol packager:
Spear Products, Inc.
P.O. Box 18993
Memphis, TN 38118

Bulk Chemicals
80 First Street
Gretna, Jefferson, LA 70053

Aerosol packager:
Bulk Chemical Dist., Inc.
No. 1 Industrial Lane
Gretna, LA 70053

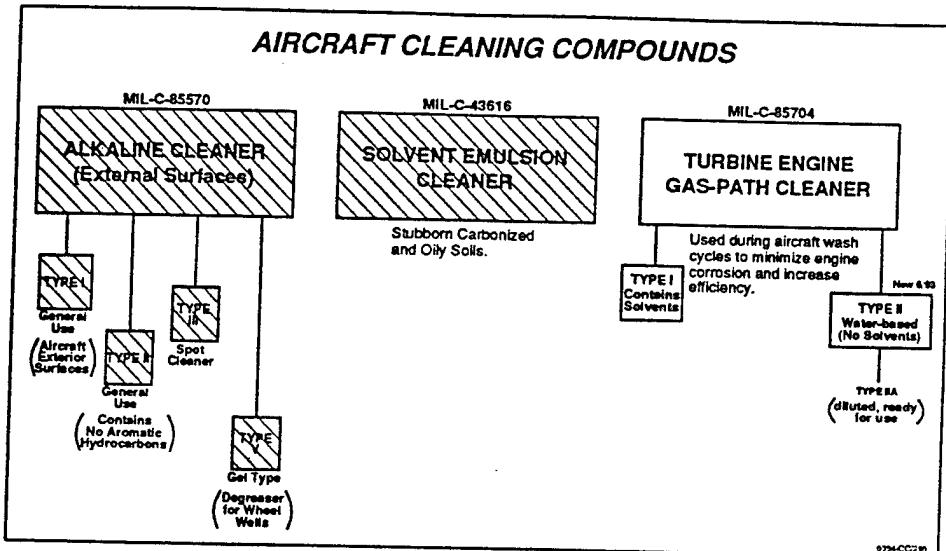
Octagon Process, Inc.
596 River Road
Edgewater, NJ 07020

Aerosol packager:
Contact Industries, Inc.
641 Dowd Avenue
Elizabeth, NJ 07201

Turco Products, Inc.
Subsidiary Pennwalt Corp.
7300 Bolsa Avenue
Westminster, CA 92684-3600

Aerosol packager:
Shields Packaging Company
21 University Road
Canton, MA 02021

5165 "G" Street
Chino, CA 91710



QPL-85704-5
28 October 1991
 SUPERSEDING
 QPL-85704-4
 1 December 1989

**QUALIFIED PRODUCTS LIST
OF
PRODUCTS QUALIFIED UNDER MILITARY SPECIFICATION
MIL-C-85704
CLEANING COMPOUND, TURBINE ENGINE GAS PATH**

This list has been prepared for use by or for the Government in the acquisition of products covered by the subject specification and such listing of a product is not intended to and does not connote endorsement of the product by the Department of Defense. All products listed herein have been qualified under the requirements for the product as specified in the latest effective issue of the applicable specification. This list is subject to change without notice; revision or amendment of this list will be issued as necessary. The listing of a product does not release the supplier from compliance with the specification requirements.

MANUFACTURER'S DESIGNATION	MANUFACTURER'S NAME*
B&B 3100	<i>B&B Tritech, Inc.</i>
ED-563	<i>Eldorado Chemical Company, Inc.</i>
Megapower JEC	<i>Fine Organics Corp.</i>
Penair M-5704A	<i>Penetone Corporation</i>
T-5884	<i>Turco Products Inc.</i>
Octakleen 5400	<i>Octagon Process, Inc.</i>
Ardrox 252L	<i>Ardrox, Inc.</i>
EZE 429	<i>EZE Products, Inc.</i>

*See Appendix for addresses.

MANUFACTURER ADDRESS APPENDIX

The following is an alphabetical listing of the manufacturers and plants.

B&B Tritech, Inc. 875 West 20th St. Hialeah, FL 33010	<u>Plants:</u> Same as address. 101 East Baseline Road Gilbert, AZ 85234
	164 Berkely Road Mt. Royal, NJ 08061
	6500 Watson Street Union City, GA 30291
Eldorado Chemical Company, Inc. P.O. Drawer 34837 San Antonio, TX 78265	<u>Plants:</u> Same as address. 14350 Lookout Road San Antonio, TX 78233
	1805 East Charter Way Stockton, CA 95205
Fine Organics Corp. 205 Main Street Lodi, NJ 07644-0995	<u>Plant:</u> Same as address.
Penetone Corporation 74 Hudson Avenue Tenafly, NJ 07670	<u>Plants:</u> Same as address. 10900 Secant Ave. Montreal, Quebec Canada

Turco Products Inc.
7300 Bolsa Avenue
Westminster, CA 92684

Plants:

Same as address.	State Route 95 West Marion, OH 43302	Ajax Chemicals Factory St. Granville 2142, N.S.W. Australia
Deane & Company 190 Chemin Drive Pointe Claire, Quebec Canada	Turco Products, LTD Clark House, Brunel Corby, Northants England	Turco-France, S.A. 3 et 5 Impasse dis Quai de Industrie 91200 Athis-Mons (Essone) France
Turco Chemie GmbH Rossaugweg 50 D-2 Hamburg, 76 Germany	Atlanta Hellas Chem. Pircaus Str. 91 Pircaus Greece	Chemotas Ltd. Holon, Ind. Zone 13, Hasadna St. Tel Aviv, Israel
Turco Italiana S.P.A. 1 Via Artigianale 29 25010 Montirone Italy	Kakoki Trading Co. Turco Division Takanawa Kaneo Bldg. 3-25-22, Takanawa Minato-Ku Tokyo, Japan 108	Turco & Descalzi de Mexico, S.A. de C.V. Poniente 148 No. 974 Mexico 16, D.F. Mexico
Turco Produkten B.V. Verlengde Blokkeweg 12 6717 AD Ede Netherland	Turco Expanola, S.A. Feixa Llarga/Calle 43 Sector F-Zona Franca Barcelona, Spain	China Youths Chemical Corporation 39, Tong-Yun Road Chung-Li, Shieh Taiwan, R.O.C.

Octagon Process, Inc.
596 River Road
Edgewater, NJ 07020

Plant:
Same as address.

Ardrox, Inc.
16961 Knott Avenue
La Mirada, CA 900638

Plants:
Same as address.

Ardrox Inc.
901 Sherwood Drive
Lade Bluff, IL 60044

Ardrox Inc.
11450 Gulf Stream Dr.
Arlinton, TN 38002

Ardrox Inc.
P.O. Box 814
St. Catharines
Ontario L2R 6Y3
Canada

Brent Chemicals,
G.M.B.H.
Postfach 1357
Robert-Bosch-Strasse 46
6909 Walldorf
Germany

Brent Chemicals, S.p.A.
P.O. Box C.P. 39
Viale A Volta 41
20090 Cusago
Milan
Italy

N.V. Brent S.A.
Kaleweg 8
B9910 Mariakerke
Belgium

Ardrox S.A.
41 Rue Des
Frances-Bourgeois
75004 Paris
France

Brent Iberica S.A.
Apartado 53
Torrejon De Ardoz
Madrid
Spain

BCI (Singapore) PTE Ltd.
29 Playfair Road
Singapore, 1336

Ardrox-Agena Quimica
Ltda.
Rua Camboriu 112
20.971
Rio De Janeiro - RJ
Brazil

Brent Mexicana
SA de CV
Col. San Miguel Chapel
Tepec
11850 Mexico D.F.
Mexico

SureChem Industries
Pty Ltd.
P.O. Box 144
Blacktown
NSW 2148
Australia

Ardrox Pyrene Ltd.
The Ridgeway
Iver Bucks SL0 9JJ
England

EZE Products, Inc.
P.O. Box 5744
Greenville, SC 29606

Plants:
Same as address.

603 High Tech Court
Greer, SC 29651

1265 Hendrickson Drive
Kaloma, WA 98625

802. AIRCRAFT COATINGS.

(a) As with aircraft cleaning, the choice and frequency of coating aircraft varies with flying conditions and aesthetic taste. All military aircraft are coated. Since the specified hydraulic fluid for military aircraft is different from that used in commercial aviation, the formulations of military coatings reflect this difference. Since these coatings would not be resistant to commercial hydraulic fluids, a qualified products list used by the military will not be presented here.

It should be realized that aircraft surface coatings provide the initial and sometimes the only protection of the part against corrosion. Normally when aircraft are painted, a primer, containing corrosion inhibitors, is applied first. The primer promotes adhesion and provides some corrosion protection. The topcoat provides a barrier to the environment and thus should be chemical as well as weather resistant. Typically, primers are usually epoxy based and top coats are usually polyurethanes. The toxic and flammable nature of paints, solvents and thinners must be considered when painting aircraft. With today's EPA restrictions on volatile organic compounds, (V.O.C.'s), and chromates, effective as inhibitors, new coatings that are waterborne and free of chromate inhibitors are coming into use. Self priming topcoats containing no chromates are already in use in the military.

803. SEALANTS.

(a) Elastomeric sealants are widely used on naval aircraft to seal out the environment. The most popular at the present time are the polysulfide sealants that contain soluble corrosion inhibitors. These are covered by military specification MIL-S-81733. Ordinary polysulfide sealants (MIL-S-8802) can minimize corrosion of metals in high humidity environments, but cannot prevent it completely because all polymers are permeable to moisture. The inhibited sealant is very effective when used in faying surfaces and butt joints, for wet installation of fasteners and over fastener patterns and to insulate dissimilar metals. Both MIL-S-8802 and MIL-S-817733 are two component (part) systems. MIL-S-29574 is a new, two part type of fast cure aircraft sealant based on polythioether polymers. These sealants, used to seal aircraft fuel tanks, wings, doors and canopies, are excellent for repair since they cure in 4-5 hours, compared to 24 hours for the conventional polysulfide sealants. Another feature of the polythioether sealants is the 100°F higher temperature capability (up to 350°F) over polysulfide materials. Polythioether shows improved adhesion and has demonstrated its use for co-curing repair of graphite/epoxy composite aircraft components. The polythioether sealant polymer is also used in sprayable fuel tank coatings, and both corrosion inhibited and conductive aircraft sealants. All of the above two-part systems are resistant to aircraft hydraulic fluids. MIL-A-46146 is a one component (part) silicone based, room temperature vulcanization (RTV) sealant that has temperature capability to 400°F but is

not fluid resistant. Acetic acid curing RTVs are corrosive, do not meet MIL-A-46146 requirements, and are not recommended for use.

The following chart gives an overall view of the four sealants used for aircraft corrosion control. (CHART)

(b) Typical applications of sealants on aircraft are:

- Faying surface and seam sealing to minimize moisture intrusion,
- Wet installation of fasteners to minimize moisture intrusion,
- Fuel sealing (fuel tanks),
- Pressure area sealing (cabin areas),
- Weather sealing (exterior skin surfaces),
- Firewall sealing (engine areas),
- Electrical sealing (bulkhead wiring, electrical connectors and components),
- Acid-resistant sealing (battery compartments, lavatory tanks),
- Window sealing (windows),
- High temperature sealing (engine areas, anti-icing ducts, some electronics), and
- Aerodynamic sealing (exterior skin surfaces).

(c) Qualified product lists exist for MIL-S-8802 and MIL-S-81733 and are provided on pages 27, 28 and 30, respectively. The manufacturer's listings are on pages 29 and 31, respectively. The qualifying agency for MIL-S-8802 is the Air Force's Wright Laboratories, Dayton Ohio. The qualifying agency for MIL-S-81733 is the Naval Air Warfare Center, Aircraft Division, Warminster, PA. Both MIL-S-29574 and MIL-A-46146 do not have qualified lists but are purchased under first article inspection procedures. At present, the only known manufacturer of the fast cure polythioether covered under MIL-S-29574, is:

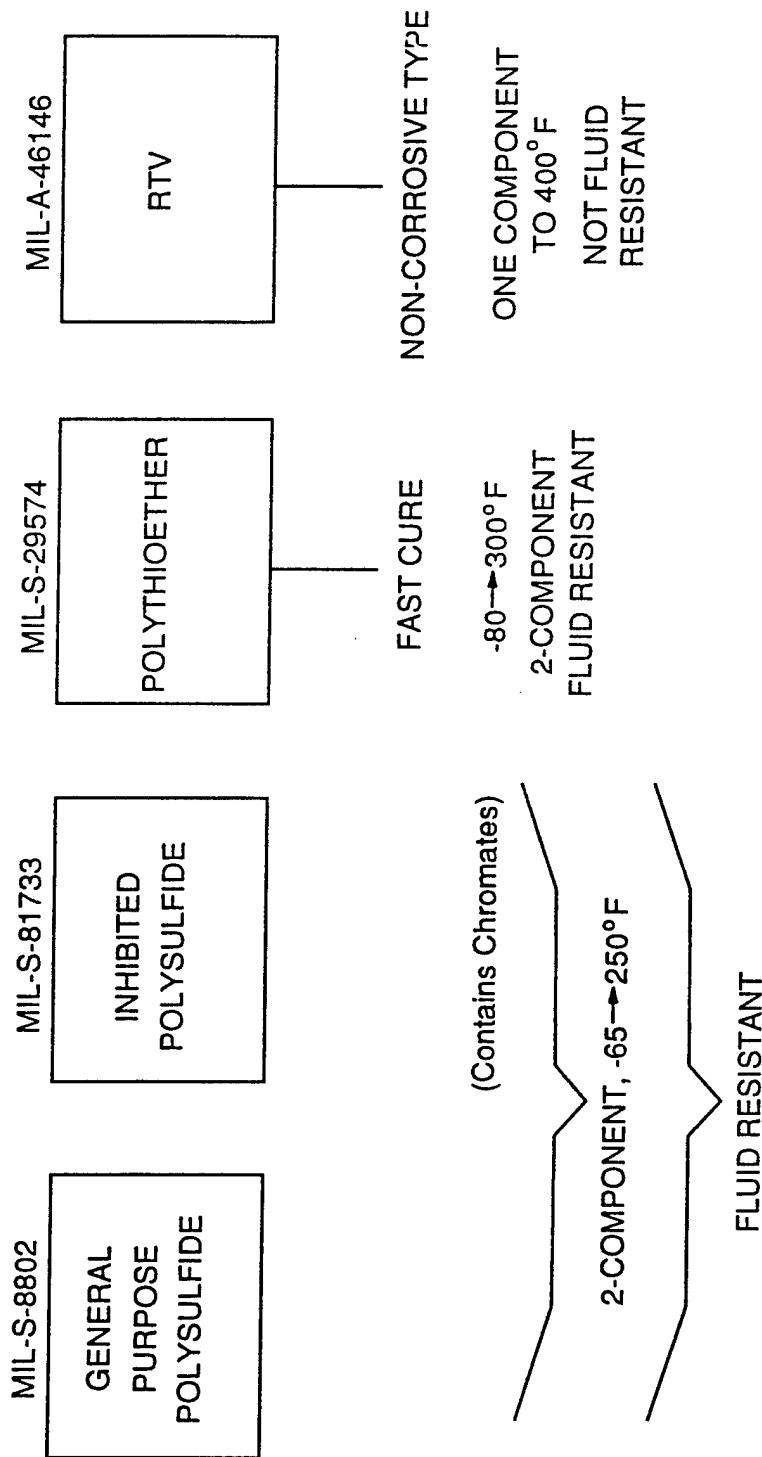
Courtaulds Aerospace
2820 Empire Avenue
Burbank, CA 91504

General Electric and Dow Corning Corp. are two suppliers of MIL-A-46146.

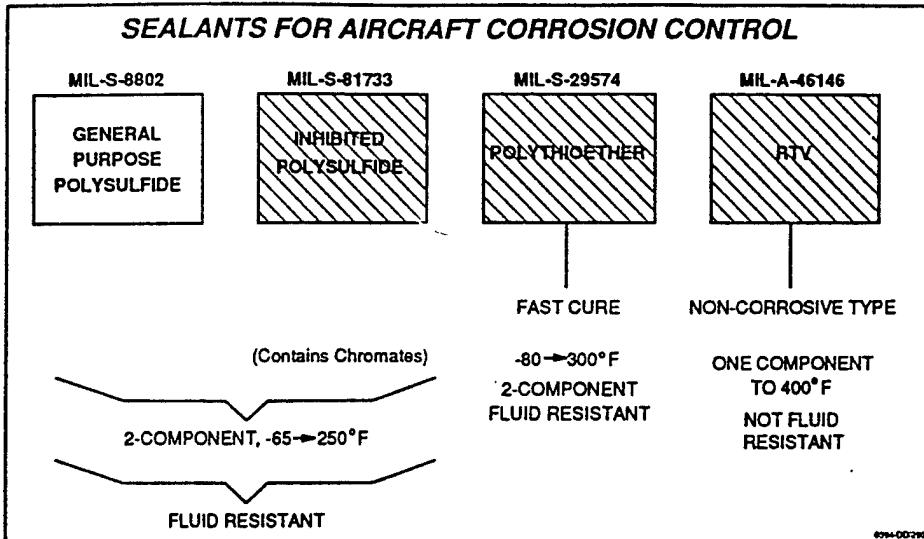
The following are lists of qualified products for two sealants that are in current military use and are recommended for use on aircraft as ownership and warranties allow:

SEALANTS FOR AIRCRAFT CORROSION CONTROL

NAWCADWAR-94099-60



0384-93B/280

SEALANTS FOR AIRCRAFT CORROSION CONTROL

QPL-8802-22
16 March 1992
 SUPERSEDING
 QPL-8802-21
 4 October 1990

**QUALIFIED PRODUCTS LIST
OF
PRODUCTS QUALIFIED UNDER MILITARY SPECIFICATION
MIL-C-8802**

**SEALING COMPOUND, TEMPERATURE-RESISTANT, INTEGRAL FUEL
TANKS AND FUEL CELL CAVITIES, HIGH-ADHESION**

This list has been prepared for use by or for the Government in the acquisition of products covered by the subject specification and such listing of a product is not intended to and does not connote endorsement of the product by the Department of Defense. All products listed herein have been qualified under the requirements for the product as specified in the latest effective issue of the applicable specification. This list is subject to change without notice; revision or amendment of this list will be issued as necessary. The listing of a product does not release the supplier from compliance with the specification requirements.

GOVERNMENT DESIGNATION*	MANUFACTURER'S DESIGNATION	MANUFACTURER'S NAME**
Class A-1/2 Class A-2 Class B-1/2 Class B-1 Class B-2	PR-1422	Courtalds Aerospace, formerly Products Research & Chemical Corp.
Class B-2	BR 4005	D Aircraft Products
Class B-1/2 Class B-2	FR-1072	Fiber Resin Corp.

*Class A - Brushable

Class B - Injectable (spatula grade)

Class C - Faying Surfaces Only

** See Appendix for addresses.

– Dash number following class gives the working life of the product in hours.

GOVERNMENT DESIGNATION*	MANUFACTURER'S DESIGNATION	MANUFACTURER'S NAME**
Class A-1/2 Class A-1 Class A-2 Class B-1/2 Class B-1 Class B-2	CS-3204	<i>Flamemaster Corp.</i>
Class B-1 Class B-2 Class B-4	WS-8020	<i>J&R Industries</i>
Class B-1/2 Class B-1 Class B-2	MC-236	<i>Morton International</i>
Class B-2 Class A-1/2 Class A-1 Class A-2 Class A-2 Class B-1/2 Class B-1/2 Class B-1 Class B-2 Class B-2 Class B-4 Class B-4 Class C-20 Class C-20 Class C-80	PR-1440 PR-1440 PR-1440 Pro-Seal 890 PR-1440 Pro-Seal 890 PR-1440 PR-1440 Pro-Seal 890 PR-1487 Pro-Seal 890 PR-1440 Pro-Seal 890 PR-1440 Pro-Seal 890	<i>Courtaulds Aerospace, formerly Products Research & Chemical Corp.</i>

*Class A - Brushable

Class B - Injectable (spatula grade)

Class C - Faying Surfaces Only

** See Appendix for addresses.

-- Dash number following class gives the working life of the product in hours.

QPL-8802-22

MANUFACTURER ADDRESS APPENDIX

The following is an alphabetical listing of the manufacturers and plants.

Courtaulds Aerospace, formerly
Products Research & Chemical Corp.
5454 San Fernando Road
P.O. Box 1800
Glendale, CA 91203

Plants:
Same as address.

410 Jersey Avenue
Gloucester City, NJ 08030

Weston 487
Ontario, Canada

D Aircraft Products
1191 Hawk Circle
Anaheim, CA 92807

Plant:
Same as address.

Fiber Resin Corp.
Subsidiary of H.B. Fuller Co
170 W Providencia Avenue
Burbank, CA 91503

Plants:
Same as address.

2727 Kinney NW
Grand Rapids, MI 49504

Flamemaster Corp.
Chem Seal Division
11120 Sherman Way
Sun Valley, CA 91353-1458

Plant:
Same as address.

J&R Industries
12601 San Vincente Blvd.
Los Angeles, CA 90049

Plants:
Same as address.

800 E. Anaheim St.
Wilmington, CA 90744

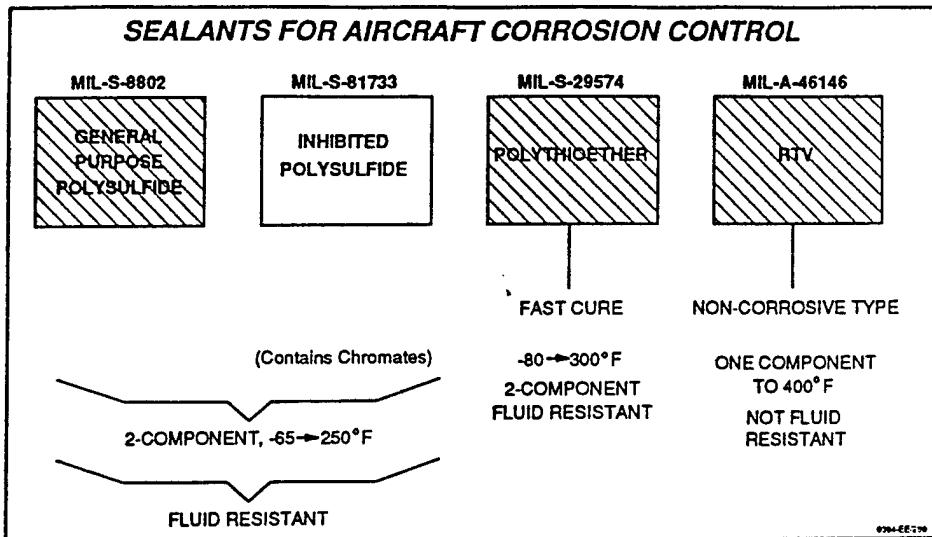
Morton International
7341 Anaconda Avenue
Garden Grove, CA 92641

Plant:
Same as address.

Courtaulds Aerospace, formerly
Products Research & Chemical Corp.
5454 San Fernando Road
P.O. Box 1800
Glendale, CA 91203

Plants:
Same as address.

410 Jersey Avenue
Gloucester City, NJ 08030



QPL-81733-8
16 January 1992
SUPERSEDING
QPL-81733-7
10 September 1986

QUALIFIED PRODUCTS LIST

OF

PRODUCTS QUALIFIED UNDER MILITARY SPECIFICATION

MIL-S-81733

SEALING AND COATING COMPOUND, CORROSION INHIBITIVE

This list has been prepared for use by or for the Government in the acquisition of products covered by the subject specification and such listing of a product is not intended to and does not connote endorsement of the product by the Department of Defense. All products listed herein have been qualified under the requirements for the product as specified in the latest effective issue of the applicable specification. This list is subject to change without notice; revision or amendment of this list will be issued as necessary. The listing of a product does not release the supplier from compliance with the specification requirements.

GOVERNMENT DESIGNATION*	MANUFACTURER'S DESIGNATION	MANUFACTURER'S NAME**
Type I - 1/2	P/S 870 A-1/2	Courtauld Aerospace, formerly Products Research & Chemical (PRC) Corp.
Type I - 1/2	PR 1440G A-1/2	
Type I - 2	P/S 870 A-2	
Type I - 2	PR-1440G A-2	
Type II - 1/2	P/S 870 B-1/2	
Type II - 1/2	PR-1440G B-1/2	
Type II - 2	P/S 870 B-2	
Type II - 2	PR-1440G B-2	
Type II - 4	P/S 870 B-4	
Type II - 4	PR-1440G B-4	
Type II - 2	PR-1436G B-2	
Type III - 1	CS-3214 (Sprayable)	
Type III - 1	P/S 870 C-1	
Type III - 1	PR-1440G (Sprayable)	
Type III - 1	PR-1436G (Sprayable)	
Type IV - 12	PR-1431-G Type I	
Type IV - 12	P/S 870 C-12	
Type IV - 12	PR-1440G C-12	
Type IV - 48	P/S 870 C-48	
Type IV - 48	PR-1440G C-48	
Type IV - 24	P/S 870 C-24	
Type IV - 24	PR-1440G C-48	

* Type I - Brushable

Type II - Injectable (spatula grade)

Type III - Sprayable

Type IV - Faying Surfaces Only

** See Appendix for addresses

- Dash number following type gives the working life of the product in hours.

MANUFACTURER ADDRESS APPENDIX

The following is an alphabetical listing of the manufacturers and plants.

Courtaulds Aerospace, formerly
Products Research &
Chemical (PRC) Corp.
5430 San Fernando Rd.
Glendale, CA 91209

Plants:
Same as address.
Gloucester City, NJ

Chem Seal Corp. of America
Division of Flame-Master
11120 Sherman Way
Sun Valley, CA 91352

Plants:
Same as address.
1805 East Charter Way
Stockton, CA 95205

804. CORROSION PREVENTIVE COMPOUNDS.

(a) Corrosion preventive compounds (CPCs) or preservatives, are used to protect metal aircraft parts and components from corrosion on a temporary basis. These compounds can be separated into two major categories; water displacing and non-water displacing compounds. They may be used during manufacturing or storage of the component but more often they are used for operational preservation. Areas which are corrosion prone or where paint has been damaged should be routinely protected by CPCs until more permanent treatment can be applied (such as paint touchup or sealing). The use of CPCs provides a most effective yet underutilized tool in the prevention of corrosion on commercial aircraft.

A simplified chart of the corrosion preventative compounds that are in wide use for operational preservation of military aircraft is shown below.

805. DESCRIPTION OF CPCs.

(b) Water displacing compounds. From the aforementioned chart; these compounds are covered under the military specifications of MIL-C-81309, an ultra-thin CPC that dries to a soft film, and MIL-C-85054, AMLGUARD, a CPC that dries to a hard clear finish. Both MIL-C-81309 and MIL-C-85054 contain effective corrosion inhibitors. These CPCs are able to penetrate into cracks, crevices, voids in faying edges, around fastener heads, and into hinges. They usually provide very thin coatings, one mil (0.001 inch) or less in thickness (a dollar bill is five mils thick), and are usually clear or translucent. Most water displacing compounds are soft, oily compounds which cannot provide long term protection outdoors or in areas which are frequently handled. AMLGUARD, MIL-C-85054, differs from these water displacing compounds by forming a relatively hard, dry film, and therefore can be used for protection outdoors and in areas of frequent handling. As is shown on the preceding chart, MIL-C-85054, commonly called AMLGUARD, should not be used on moving parts, such as threaded assemblies or hinges, since it dries to a hard, transparent finish. Although AMLGUARD appears to be permanent, it can be removed with any approved common solvent.

(c) Non-water displacing compounds: MIL-C-16173 is a non-water displacing CPC. Grade 4 of MIL-C-16173 is in common use. It remains as a thick, light brown soft film. Although all three MIL SPEC CPCs shown in the chart contain corrosion inhibitors, the most effective corrosive inhibition is achieved with MIL-C-85054, AMLGUARD, which contains sulfonates and organic phosphate inhibitors.

(d) Assessments/Suggestions: It is emphasized that the combination of water displacement with chemical inhibitors present in both MIL-C-81309 and MIL-C-85054, provides the best possible protection of any class of corro-

sion preventive compounds. Some commercial products that are widely available merely provide water displacement with little or no chemical inhibition. Other products, such as MIL-C-16173, provide a physical barrier and chemical inhibition but no water displacement. Thus it is strongly suggested that maintenance programs not only account for corrosion control but also actively utilize the best possible CPCs on their aircraft and use them in an expanded sense including the exterior surfaces (painted and unpainted) of airframes. It is noted that CPCs are routinely used on exterior airframe surfaces in the military but commercial transport aircraft maintenance programs have limited the use of CPCs to the interior corrosion prone areas. Observing the success of the U.S. military with such products as AMLGUARD, MIL-C-85054, utilized both internally and externally on aircraft (AMLGUARD has saved the U.S. Navy over \$50 million over a period of 9 years), it is obvious that a new dimension in corrosion control could and should be adopted by commercial aviation.

- (e) Qualified products lists exist for MIL-C-81309 and MIL-C-16173 and are provided on pages 35 through 37 and 46 through 48, respectively. The manufacturer's listings for these two CPCs are provided on pages 38 through 44 and 49 through 51, respectively. The qualifying agency for MIL-C-81309 is the Naval Air Warfare Center, A/C Division, Warminster, PA 18974. The qualifying agency for MIL-C-16173 is the Naval Sea Systems Command SEA-51222, Washington, DC 20362-5101. A qualified products list does not exist for MIL-C-85054. This material is procured under first article inspection procedures. At present, the only known manufacturer of a product covered under MIL-C-85054 is:

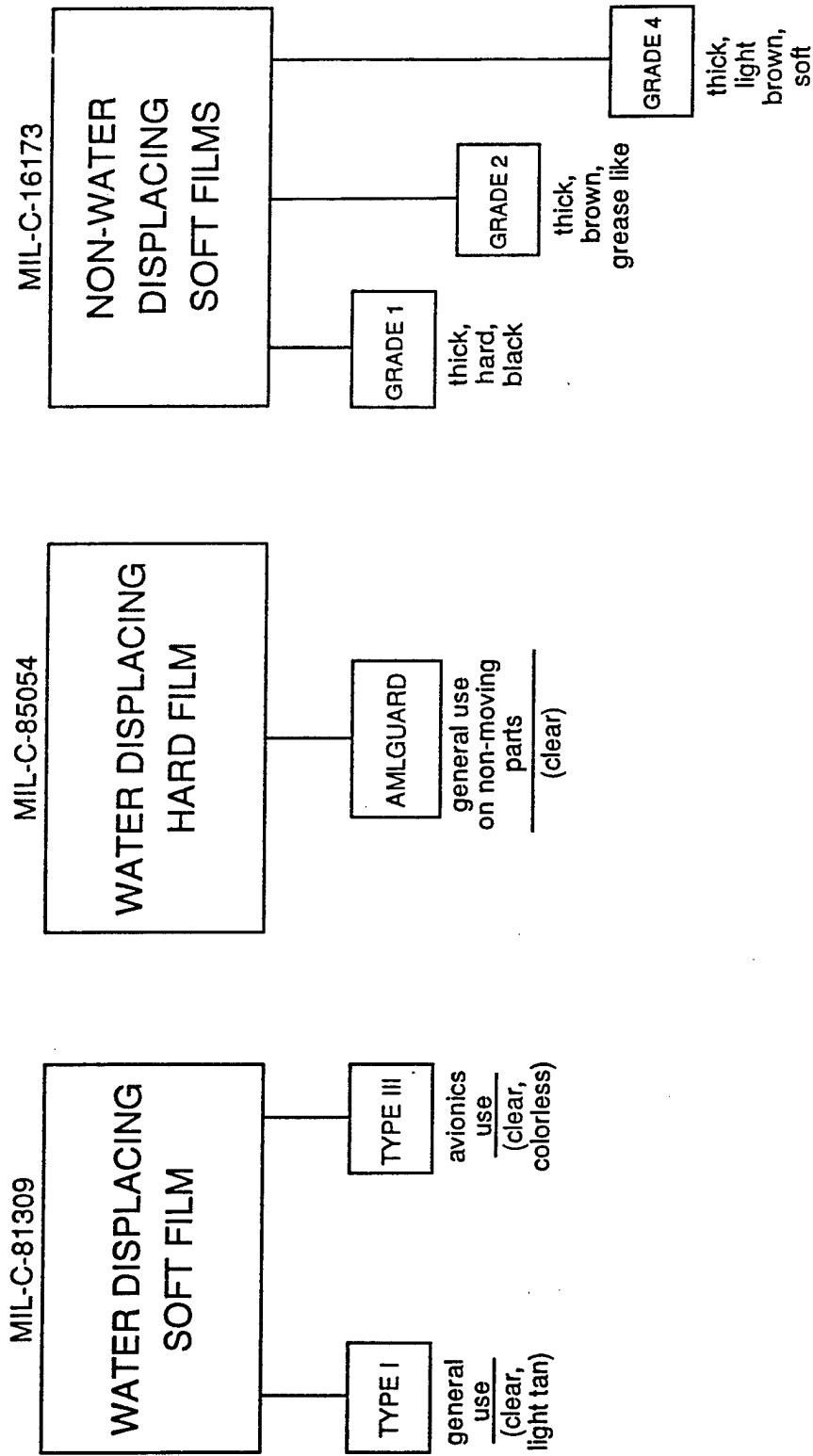
L.H.B. Industries
10440 Trenton Avenue
St. Louis, MO 63132

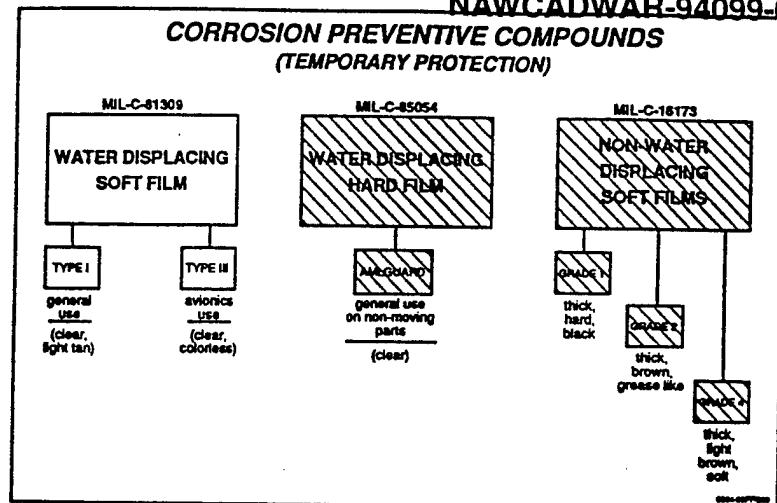
Any and all of the CPCs thus far discussed are recommended for use on aircraft surfaces as ownership and warranties allow. The following are lists of qualified products for MIL-C-81309 and MIL-C-16173 that are in current military use:

CORROSION PREVENTIVE COMPOUNDS

(TEMPORARY PROTECTION)

NAWCADWAR-94099-60





QPL-81309-21
8 January 1993
 SUPERSEDED
 QPL-81309-20
 28 June 1991

**QUALIFIED PRODUCTS LIST
OF
PRODUCTS QUALIFIED UNDER MILITARY SPECIFICATION
MIL-C-81309
CORROSION PREVENTIVE COMPOUNDS, WATER DISPLACING,
ULTRA THIN FILM**

This list has been prepared for use by or for the Government in the acquisition of products covered by the subject specification and such listing of a product is not intended to and does not connote endorsement of the product by the Department of Defense. All products listed herein have been qualified under the requirements for the product as specified in the latest effective issue of the applicable specification. This list is subject to change without notice; revision or amendment of this list will be issued as necessary. The listing of a product does not release the supplier from compliance with the specification requirements.

GOVERNMENT DESIGNATION	MANUFACTURER'S DESIGNATION	MANUFACTURER'S NAME*
Type II Class 1	Alox 2028C	<i>Alox Corp.</i>
Type II Class 1	Aidchim Alox 2028	<i>Aidchim Ltd.</i>
Type II Class 1	2028 BC-BULK	<i>Bulk Chemical Corp.</i>
Type II Class 1	Nox Rust 212	<i>Daubert Chemical Co., Inc.</i>
Type II Class 1	2775	<i>Fine Organics Corp.</i>
Type II Class 1	So-Sure 813	<i>LHB Industries</i>

*See Appendix for addresses.

GOVERNMENT DESIGNATION	MANUFACTURER'S DESIGNATION	MANUFACTURER'S NAME*
Type II Class 1	LPS-813 Bulk	<i>LPS Laboratories</i>
Type II Class 1	Octoil 5068	<i>Octagon Process, Inc.</i>
Type II Class 1	Omni 4150A	<i>Omnitech Int'l, Inc.</i>
Type II Class 1	97-SX092	<i>Selig Chemical Industries</i>
Type II Class 1	22028CM-Bulk	<i>Steven Industries, Inc.</i>
Type II Class 1	Ardrox 3204	<i>Ardrox, Inc.</i>
Type II Class 1	BATCO Rust Preventative Type II	<i>Battenfield Grease and Oil Corporation of NY</i>
Type II Class 1	706 P.D.R.P. Bulk	<i>Sprayon Products</i>
Type II Class 1	D-5026 Bulk	<i>Zip-Chem Products, Inc.</i>
Type II Class 2	Ardrox 3204 Aerosol	<i>Ardrox, Inc.</i>
Type II Class 2	2028-BCCO	<i>Bulk Chemicals Corp.</i>
Type II Class 2	So-Sure 0954-000	<i>LHB Industries</i>
Type II Class 2	LPS-813A	<i>LPS Laboratories</i>
Type II Class 2	706 P.D.R.P.	<i>Sprayon Products</i>
Type II Class 2	22028C2	<i>Steven Industries, Inc.</i>
Type III Class 1	Alox 2028D	<i>Alox Corporation</i>
Type III Class 1	2028 ML-BULK	<i>Bulk Chemical Corp.</i>
Type III Class 1	Nox Rust 211	<i>Daubert Chemical Co., Inc.</i>
Type III Class 1	2780	<i>Fine Organics Corp.</i>
Type III Class 1	LPS-814-BULK	<i>LPS Laboratories, Inc.</i>

*See Appendix for addresses.

NAWCADWAR-94099-60

QPL-81309-21

GOVERNMENT DESIGNATION	MANUFACTURER'S DESIGNATION	MANUFACTURER'S NAME*
Type III Class 1	Octoil 5069	<i>Octagon Processes, Inc.</i>
Type III Class 1	22028CM-3 Bulk	<i>Steven Industries, Inc.</i>
Type III Class 1	Technolube FE-008	<i>Technolube Products</i>
Type III Class	Ardrox 3205	<i>Ardrox, Inc.</i>
Type III Class 1	BATCO Rust Preventative Type III	<i>Battenfield Grease and Oil Corporation of NY</i>
Type III Class 1	CRC 3-36	<i>CRC Chemicals Europe, NV</i>
Type III Class 1	ACF-50	<i>Lear Chemical Research Corp.</i>
Type III Class 2	2028-MLCO	<i>Bulk Chemical Corp.</i>
Type III Class 2	So-Sure 0964-000	<i>LHB Industries</i>
Type III Class 2	LPS-814A	<i>LPS Laboratories</i>
Type III Class 2	22028C2-3	<i>Steven Industries, Inc.</i>
Type III Class 2	Ardrox 3205 Aerosol	<i>Ardrox, Inc.</i>
Type III Class 2	CRC 3-36 Aerosol	<i>CRC Chemicals Europe NV</i>
Type III Class 2	ACF-50 Aerosol	<i>Lear Chemical Research Corp.</i>

*See Appendix for addresses.

MANUFACTURER ADDRESS APPENDIX

The following is an alphabetical listing of the manufacturers and plants.

Alox Corp.

P.O. Box 517

Niagara Falls, NY 14302

Plant:

Same as address.

Aidchim Ltd.

P.O. Box 103

Roanana 43100, Israel

Plant:

Same as address.

Bulk Chemical Corp.

80 First Street

Gretna, LA 70053

Plant:

Same as address.

Daubert Chemical Co., Inc.

4700 S. Central Avenue

Chicago, IL 60638

Plant:

Same as address.

Fine Organics Corp.

6935 West 62nd Street

Chicago, IL 60638

Plant:

Same as address.

LHB Industries

10440 Trenton Avenue

St. Louis, MO 63132

Plant:

Same as address.

LPS Laboratories

4647 Hugh Howell Road

Tucker, GA 30084

Plant:

Same as address.

Octagon Process, Inc.

596 River Road

Edgewater, NJ 07020

Plant:

Same as address.

Omnitech Int'l, Inc.

800 North Arcadia Road

Thibodaux, LA 70301

Plant:

Same as address.

Selig Chemical Industries
840 Selig Drive SW
Atlanta, GA 30336-2240

Plant:
Same as address.

Steven Industries, Inc.
39 Avenue C
Bayonne, NJ 07002

Plant:
Same as address.

Ardrox, Inc.
16961 Knott Avenue
La Mirada, CA 90638

Plants:

Same as address.

Brent Mexicana
S.A. De C.V.
Tiburcio Montiel 81
Col. San Miguel
Chapultepec
11850 - Mexico D.F.
Mexico

Brent Iberica SA
Apartado 53
Torrejon de Ardoz
Madrid, Spain

Ardrox Limited
P.O. Box 814
St. Catharines, Ontario
Canada L2R 6Y3

Ardrox Pyrene, Ltd.
The Ridgeway, Iver,
Buckingshamshire
SLO 9JJ
United Kingdom

Brent Chemical SpA
Viale a Volta 41
20090 Cusago (Milan)
Italy

Ardrox Agena
Quimica Ltda.
Rua Camboriu 112/136
C.E.P. 20971
Rio De Janeiro
Brazil

Ardrox SA,
41 Rue de Francs
Bourgeois,
Paris 75004,
France

BCI (Singapore)
Pte Ltd.
29 Playfair Road
Singapore

MV Brent SA,
Kaleweg 24-26,
B9910 Mariakerke,
Belgium

Brent Chemicals GmbH
Postfach 1357
Robert Bosch Strasse 46
6906 Walldorf
Federal Republic of
Germany

Battenfield Grease and
Oil Corporation of NY
1174 Erie Avenue
Box 728
North Tonawanda, NY 14120

Plants:
Same as address.

Battenfield-American, Inc.
1575 Clinton Street
Buffalo, NY 14206

Sprayon Products
6830 Cochran Road
Solon, OH 44139-3908

Plants:
Same as address.

26300 Fargo Avenue
Bedford, Heights, OH 44146

Zip-Chem Products, Inc.
1860 Dobbin Drive
San Jose, CA 95133

Plant:
Same as address.

Ardrox, Inc.
16961 Knott Avenue
La Mirada, CA 90638

Plant:
Same as address.

Aerosol packager:
Shield Packaging
516 G Street
Chino, CA 91710

Bulk Chemical Corp.
80 First Street
Gretna, LA 70053

Plant:
Same as address.

LHB Industries
10440 Trenton Avenue
St. Louis, MO 63132

Plant:
Same as address.

Aerosol packager:
LHB Industries
8833 Fleischer Place
Berkeley, MO 63134

NAWCADWAR-94099-60
QPL-81309-21

LPS Laboratories
4647 Hugh Howell Road
Tucker, GA 30084

Plant:
Same as address.

Aerosol packager:
Same as address.

Sprayon Products
26300 Fargo Avenue
Bedford Heights, OH 44146

Plant:
Same as address.

Aerosol packager:
Same as address.

Steven Industries, Inc.
39 Avenue C
Bayonne, NJ 07002

Plant:
Same as address.

Aerosol packager:
Allstate Industries
834 Peninsula Blvd.
Woodmere, NY 11598

Alox Corporation
P.O. Box 517
Niagara Falls, NY 14302

Plant:
Same as address.

Bulk Chemical Corp.
80 First Street
Tucker, GA 30084

Plant:
Same as address.

Daubert Chemical Co., Inc.
4700 S. Central SW
Chicago, IL 60638

Plant:
Same as address.

Fine Organics Corp.
6935 West 62nd Street
Chicago, IL 60638

Plant:
Same as address.

LPS Laboratories, Inc.
4647 Hugh Howell Road
Gretna, LA 70053

Plant:
Same as address.

Octagon Processes, Inc.
596 River Road
Edgewater, NJ 07020

Plant:
Same as address.

Steven Industries, Inc.
39 Avenue C
Bayonne, NJ 07002

Plant:
Same as address.

Technolube Products
5814 East 61st Street
Los Angeles, CA 90040

Plant:
Same as address.

Ardrox Inc.
16961 Knott Avenue
La Mirada, CA 90638

Plants:

Same as address. Brent Mexicana S. A. Brent Iberica SA
 De C.V. Apartado 53
 Tiburcio Montiel 81 Torrejon de Ardoz
 Col. San Miguel Madrid, Spain
 Chapultepec
 11850 - Mexico D.F.
 Mexico

Ardrox Limited MV Brent SA Brent Chemical SpA
P.O. Box 814 SLO 9JJ Viale a Volta 41
St. Catharines, Kaleweg 24-26 20090 Cusago (Milan)
Ontario B9910 Mariakerke Italy
Canada L2R 6Y3 Belgium

Ardrox SA BCI (Singapore) Ardrox Agena
41 Rue de Francs PTE Ltd. Quimica Ltda
 Bourgeois Rua Camboriu 112/136
Paris 75004 29 Playfair Road C.E.P. 20971
France Singapore Rio De Janeiro
 Brazil

Ardrox Pyrene, Ltd. Brent Chemicals GmbH
The Ridgeway, Postfach 1357
Iver Robert Bosch Strasse 46
SLO 9JJ 6906 Walldorf
United Kingdom Federal Republic of
 Germany

Battenfield Grease and
Oil Corporation of NY
1174 Erie Avenue
Box 728
North Tonawanda, NY 14120

Plants:
Same as address.

Battenfield-American, Inc.
1575 Clinton Street
Buffalo, NY 14206

CRC Chemicals Europe, NV
Touwslagersstratt 1
B-9140 Zele, Belgium

Plant:
Same as address.

Lear Chemical Research Corp.
1285 Britannia Road East
Mississauga, Ontario
Canada L4W1C7

Plant:
Same as address.

Bulk Chemical Corp.
80 First Street
Gretna, LA 70053

Plant:
Same as address.

Aerosol packager:
Same as address.

LHB Industries
10440 Trenton Avenue
St. Louis, MO 63132

Plant:
Same as address.

Aerosol packager:
LHB Industries
8833 Fleischer Place
Berkeley, MO 63134

LPS Laboratories
4647 Hugh Howell Road
Tucker, GA 30084

Plant:
Same as address.

Aerosol packager:
Same as address.

Steven Industries, Inc.
39 Avenue C
Bayonne, NJ 07002

Plant:
Same as address.

Aerosol packager:
Allstate Industries
834 Peninsula Blvd.
Woodmere, NY 11598

Ardrox, Inc.
16961 Knott Ave.
La Mirada, CA 90638

Plant:
Same as address.

Aerosol packager:
Shield Packaging
5165 G Street
Chino, CA 91710

CRC Chemicals Europe NV
Touwslagersstratt 1
B9140 Zele, Belgium

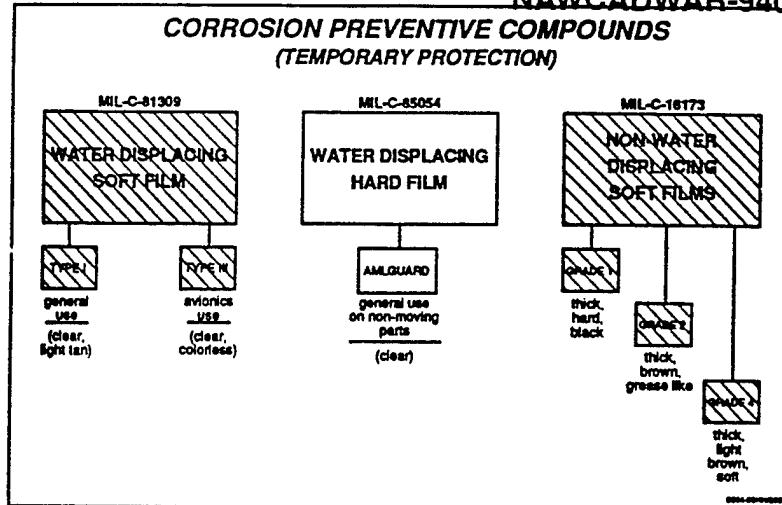
Plant:
Same as address.

Aerosol packager:
Same as address.

Lear Chemical
Research Corp.
1285 Britannia Rd. East
Mississauga, Ontario
Canada L4W1C7

Plant:
Same as address.

Aerosol packager:
Spray Pak Industries, Inc.
101 Devon Road
Brampton, Ontario
Canada L6T 5A4

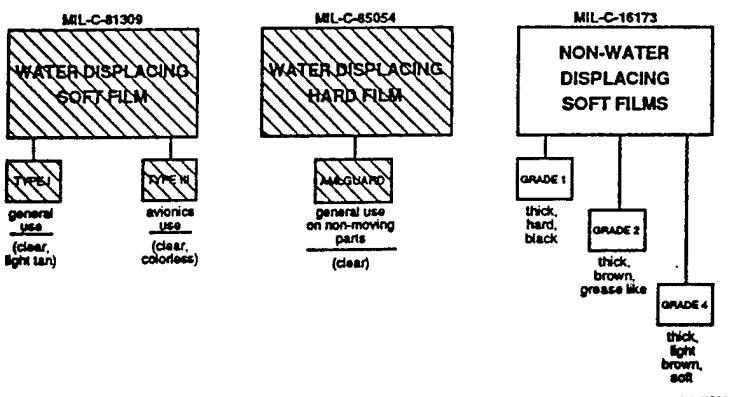


MIL-C-85054

PRODUCTS QUALIFIED UNDER MILITARY SPECIFICATION**MIL-C-85054****CORROSION PREVENTIVE COMPOUNDS, WATER DISPLACING,
HARD FILM**

A qualified products list does not exist for MIL-C-85054. This material is procured under first article inspection procedures. At present, the only known manufacturer of a product covered under MIL-C-85054 is:

L. H. B. Industries
10440 Trenton Avenue
St. Louis, MO 63132

**CORROSION PREVENTIVE COMPOUNDS
(TEMPORARY PROTECTION)**


QPL-16173-71
12 November 1991
 SUPERSEDED
 QPL-16173-70
 16 October 1990

QUALIFIED PRODUCTS LIST
OF
PRODUCTS QUALIFIED UNDER MILITARY SPECIFICATION
MIL-C-16173
**CORROSION PREVENTIVE COMPOUND, SOLVENT CUTBACK,
COLD-APPLICATION**

This list has been prepared for use by or for the Government in the acquisition of products covered by the subject specification and such listing of a product is not intended to and does not connote endorsement of the product by the Department of Defense. All products listed herein have been qualified under the requirements for the product as specified in the latest effective issue of the applicable specification. This list is subject to change without notice; revision or amendment of this list will be issued as necessary. The listing of a product does not release the supplier from compliance with the specification requirements.

GOVERNMENT DESIGNATION	MANUFACTURER'S DESIGNATION	MANUFACTURER'S NAME*
Grade 1	TECTYL 890	Ashland Industrial Products Inc.
Grade 1	TECTYL 891	Ashland Industrial Products Inc.
Grade 1	890-BC	Bulk Chemicals Distributors Inc.
Grade 1	Rusterizer 12-R-2	Bulk Chemicals Distributors, Inc.
Grade 1	Rusterizer 12	Bulk Chemicals Distributors, Inc.
Grade 1	Braycote 103	Castrol Inc.
Grade 1	Convoy 731	Convoy Oil Corporation
Grade 1	NOX-RUST 201B	Daubert Chemical Company

*See Appendix for addresses.

GOVERNMENT DESIGNATION	MANUFACTURER'S DESIGNATION	MANUFACTURER'S NAME*
Grade 1	Veedoi Anorustol 297	<i>Deutsche Veedol GmbH</i>
Grade 1	Interfilm Type II Black	<i>Esgard, Inc.</i>
Grade 1	F & L 5890	<i>F & L Company, Inc.</i>
Grade 1	Jesco 707	<i>Jesco Resources, Inc.</i>
Grade 1	Steelgard MS-1	<i>Harry Miller Corp.</i>
Grade 1	Royco 103	<i>Royal Lubricants Co., Inc.</i>
Grade 1	No-Rust 21B	<i>Steven Industries</i>
Grade 1	NOKORODE 731	<i>Lion Oil Company</i>
Grade 1	NOKORODE 731-R	<i>Lion Oil Company</i>
Grade 2	TECTYL 502C	<i>Ashland Industrial Products Inc.</i>
Grade 2	502C-BC	<i>Bulk Chemicals Distributors Inc.</i>
Grade 2	BRAYCOTE 137	<i>Castrol Inc.</i>
Grade 2	Convoy 732	<i>Convoy Oil Corporation</i>
Grade 2	Nox-Rust 207	<i>Daubert Chemical Company</i>
Grade 2	Lubra Kote Black	<i>Esgard, Inc.</i>
Grade 2	ESGARD PL-2	<i>Esgard, Inc.</i>
Grade 2	F & L 5502-C	<i>F & L Company, Inc.</i>
Grade 2	Rust Preventive 1612A	<i>Franklin Oil Corp. (Ohio)</i>
Grade 2	Steelgard MS 10	<i>Harry Miller Corporation</i>
Grade 2	LPS-3	<i>LPS Laboratories, Inc.</i>
Grade 2	ST 1502	<i>Steven Industries</i>
Grade 2	No-Rust 27	<i>Steven Industries</i>
Grade 3	Valvoline TECTYL 894	<i>Ashland Industrial Products Inc.</i>
Grade 3	894-BC	<i>Bulk Chemicals Distributors Inc.</i>
Grade 3	BRAYCOTE 153	<i>Castrol Inc.</i>
Grade 3	CONVOY 733	<i>Convoy Oil Corporation</i>
Grade 3	Nox-Rust 208	<i>Daubert Chemical Company</i>

*See Appendix for addresses.

GOVERNMENT DESIGNATION	MANUFACTURER'S DESIGNATION	MANUFACTURER'S NAME*
Grade 3	F & L 5894	<i>F & L Company, Inc.</i>
Grade 3	Rust-Foil 161-3	<i>Franklin Oil Corp. (Ohio)</i>
Grade 3	Steelgard MS-12	<i>Harry Miller Company</i>
Grade 3	Oakite Special Protective Oil Q	<i>Oakite Products, Inc.</i>
Grade 3	Ferrocote 364-BL	<i>Quaker Chemical Corporation</i>
Grade 3	ST 1894	<i>Steven Industries</i>
Grade 3	No-Rust 28	<i>Steven Industries</i>
Grade 4	TECTYL 846	<i>Ashland Industrial Products, Inc.</i>
Grade 4	846-BC	<i>Bulk Chemicals Distributors Inc.</i>
Grade 4	Braycote 194	<i>Castrol Inc.</i>
Grade 4	CONVOY 734	<i>Convoy Oil Corporation</i>
Grade 4	Nox-Rust X-110	<i>Daubert Chemical Company</i>
Grade 4	F & L 5846	<i>F & L Company, Inc.</i>
Grade 4	Steelgard MS-31	<i>Harry Miller Corp.</i>
Grade 4	Poly Oleum 5000	<i>Poly Oleum Corporation</i>
Grade 4	ST 1846	<i>Steven Industries</i>
Grade 4	No-Rust X-10	<i>Steven Industries</i>
Grade 5	TECTYL 511M	<i>Ashland Industrial Products Inc.</i>
Grade 5	511M-BC	<i>Bulk Chemicals Distributors Inc.</i>
Grade 5	CONVOY 735	<i>Convoy Oil Corporation</i>
Grade 5	F & L 5511M	<i>F & L Company, Inc.</i>
Grade 5	ST 1511	<i>Steven Industries</i>

*See Appendix for addresses.

MANUFACTURER ADDRESS APPENDIX

The following is an alphabetical listing of the manufacturers and plants.

Ashland Industrial Products, Inc.
P.O. Box 14000
Lexington, KY 40512

Plants:
Same as address.

Ashland Industrial Products, Inc.
491 Railroad Street
Rochester, PA 15074

Valvoline Inc.
Dock Road
Birkenhead, Merseyside
L41 1DR England

Valvoline Inc.
Wieldrechtseweg 39
Dordrecht, Holland

Bulk Chemicals Distributors Inc.
Div. of Malter International
80 First Street
Gretna, LA 70053

Castrol Inc.
Specialty Products Division
16715 Von Karman Avenue
Suite 230
Irvine, CA 92714

Convoy Oil Corporation
1410 North Front Street
Philadelphia, PA 19122

Daubert Chemical Company
4700 S. Central Avenue
Chicago, IL 60638

Deutsche Veedol GmbH
Hauptabteilung
Großverbraucher
Esplanade 39
2000 Hamburg 36, Germany

Esgard, Inc.
P.O. Box 2698
Lafayette, LA 70502

Plants:
Same as address.

515 Debonnaire Road
Scott, LA 70583

Franklin Oil Corp. (Ohio)
40 South Park St.
Bedford, OH 44146

Plants:
Same as address.

F & L Company, Inc.
1537 E. Del Amo Blvd.
Carson, CA 90746

Harry Miller Corp.
4th & Bristol Sts.
Philadelphia, PA 19140

Jesco Resources, Inc.
1437 Gentry St.
N. Kansas City, MO 64116

Plants:
Same as address.

Lion Oil Company
P.O. Box 7005
1000 McHenry St.
El Dorado, AR 71730

Plants:
Same as address.

LPS Laboratories, Inc.
4647 Hugh Howell Rd.
Tucker, GA 30084

Plants:
Same as address.

Oakite Products, Inc.
50 Valley Road
Berkeley Heights, NJ 07922

Plants:
10100 Hirsch Road
Houston, TX 77016

Poly Oleum Corporation
13531 Greenfield Road
Detroit, MI 48227

Quaker Chemical Corporation
Elm and Lee Streets
Conshohocken, PA 19428-0809

Plants:
Same as address.

10735 Kadota Avenue
Pomona, CA 91766

Royal Lubricants Co. Inc.
River Road
E. Hanover, NJ 07936

Plants:
Same as address.

Steven Industries
P.O. Box 8 - 39 Avenue C
Bayonne, NJ 07002

DISTRIBUTION LIST
Report No. NAWCADWAR-94099-60

	No. of Copies
Army Aviation Systems Command (DRDAD-DS) 4300 Goodfellow Blvd. St. Louis, MO 63120-1798	1
Marine Corps Systems Command Attn: Mr. L. Bradley, Ms. J. Jacks Quantico, VA	2
U.S. Coast Guard Aircraft Supply and Repair C Attn: LCDR, G. Nepert Elizabeth City, NC 27909-500	2
Naval Air Warfare Center — All Warminster, PA 18974-5000 2 copies for Code 0471 1 copy for Code 606 15 copies for Code 606G	18
Defense Technical Information Bldg. #5, Cameron Station Alexandria, VA 22302-0268	2
Center for Naval Analyses 4401 Fort Avenue P.O. Box 16268 Alexandria, VA 22302-0268	1

DATE DUE

U 9400061	
NAWCADWAR	
NAWCADWAR-94099-60	
DATE	ISSUED TO

NAVAL GENERAL LIBRARIES
Chief of Naval Education
and Training

DISTRIBUTION LIST
Report No. NAWCADWAR-94099-60

	No. of Copies
Naval Air Systems Command..... Washington, DC 20361-0001 1 copy for AIR-4101 1 copy for AIR-5304D 1 copy for AIR-41123D	5
Naval Aviation Depot (342)..... Naval Air Station Alameda, CA 94501	1
Naval Aviation Depot (343)..... Naval Air Station Jacksonville, FL 32212-0016	1
Naval Aviation Depot (343)..... Naval Air Station Norfolk, VA 23511-5188	1
Naval Aviation Depot (342)..... Naval Air Station Pensacola, FL 32508	1
Naval Aviation Depot (34400)..... Naval Air Station, North Island San Diego, CA 92135-7058	1
Marine Corps Air Station (342)..... Cherry Point, NC 28533-5030	1
Naval Air Station (AIRLANT-525)..... Norfolk, VA 23511-5188	1
Naval Air Station, North Island (AIRPAC-7412) San Diego, CA 92135-5100	1
Naval Air Station, North Island (AIRPAC-7425) San Diego, CA 92135-5112	1
Naval Aviation Engineering Service Unit (016)..... Philadelphia Naval Base Philadelphia, PA 19112-5088	10
Warner-Robbins Air Logistics Command (MMEMC, MMTRC) Robbins AFB, GA 31098	2